



ANNOUNCEMENT OF OPPORTUNITY

The THORPEX/Vaisala Cooperative Postdoctoral Research Fellowship Program

1. Overview

Vaisala announces a program to co-sponsor a limited number of postdoctoral research fellowships in support of improved global numerical weather prediction through studies that seek to assess the value and effectiveness of: 1) earth-based atmospheric observing strategies; 2) existing and new earth-based *in situ* observing systems and remote sensing systems; or 3) the interplay between earth-based and space-based observing systems.

These research studies will be carried out under the oversight of the World Weather Research Program (WWRP) and THORPEX – A Global Atmospheric Research Programme. Qualifying scientists must be postdoctoral researchers not more than four years beyond award of the Ph.D. degree or equivalent; i.e. Ph.D. completed not earlier than June 1999. Proposing scientists may be either the postdoctoral scientist or the research supervisor; it is preferred but not essential that the postdoctoral candidate be identified in the proposal¹. The proposers are expected to be scientists from weather prediction centers, academia, and non-profit research institutions.

¹ Proposals will be accepted from host institutions where the postdoctoral candidate has not been identified. Where feasible it is preferred that the postdoctoral candidate be identified; where this is not possible proposers from the host institution must articulate the criteria and process that will be used to select the postdoctoral fellow. In no case will a proposal be accepted where the host institution is not identified.

Awards will not be made to support costs associated with regular staff members at these institutions, but rather only to new postdoctoral appointees. An Evaluation Panel consisting of representatives from Vaisala and the THORPEX community will evaluate the proposals; the exact make-up of the Evaluation Panel is described later in this announcement. Each award will be made for a period not to exceed two years. Ongoing support during this period will be subject to demonstration of commitment and satisfactory performance as reflected in an annual summary report and oral presentation. Each award must be co-funded by one or more host institutions in addition to Vaisala. Vaisala will provide up to 50% support not to exceed the equivalent of €50,000 per year per award². Vaisala financial support is restricted to the postdoctoral scientist; host collateral support should be similarly restricted.

2. Research Topics

The following is a list of examples of possible research topics that could be considered within the program; other proposals may be equally or more appropriate:

- A societal and economic impact assessment of the benefit to be accrued by significantly improving weather forecast skill resulting from a hypothetical operational deployment of an in-situ observing systems such as novel rawinsonde devices or observing strategies.
- An assessment of feasibility and effectiveness of high-latitude data sets that could be obtained by radiosondes or wind profilers.
- An assessment of the likely improvement in forecast skill accruing from the hypothetical operational deployment of an in-situ observing system such as the driftsonde or other new observing system(s).
- An assessment of the likelihood that so-called sensitive regions are to be found within cloud layers. If, as suspected, this proves to be frequently the case then this will produce evidence for adding supplementary targeted mobile in-situ observations.
- An analysis of the added-value to the new generation of satellite instruments of having an embedded in-situ or other earth-based observing capability.
- An assessment of when and where sensitive regions are to be found and thence to provide an analysis of the feasibility and cost of deploying candidate in-situ observing instruments in those regions routinely.
- Determination of representative error statistics for improved utilization of radiosonde soundings in global NWP data assimilation – for example, through the use of high-frequency serial rawinsondes.

² In cases where the total cost of the appointment is less than €50,000, Vaisala may elect to sponsor at a rate greater than 50% (i.e. Vaisala may elect to sponsor more than €25,000).

3. Evaluation Criteria

- Relevance to the observing system goals of THORPEX and the role of current and future measurement systems in support of global numerical weather prediction (see Section 8 and the URL link to the THORPEX planning document).
- Scientific clarity and rigor of the proposal
- Quality of the proposal document
- Likelihood of success
- Qualifications of the postdoctoral scientist and scientific supervisor.
- Scientific and technical support of the host institution(s)
- Commitment of the host institution(s) to the equal-cost-sharing criterion of the fellowship program

4. Evaluation Panel

One member each from the following affiliations:

- Vaisala,
- WWRP/Science Steering Committee,
- THORPEX International Science Steering Committee,
- THORPEX International Core Steering Committee,
- At-Large community representative

5. Proposal Submission Information

Proposers should submit by March 15, 2003, a letter of intent to propose that includes the names of the candidate and host institution, and a 100-word abstract. Proposals should be submitted electronically not later than April 15, 2003. Proposals and letters of intent should be submitted to vaisala.thorpex@vaisala.com.

6. Required Elements of the Proposals

All proposals must be in English, single-spaced, 12 pt Arial font or equivalent, and must not exceed 11 pages, including the one-page title page.

- Title Page (1 page)
 - Title
 - Post Doctoral Applicant and Science Supervisor(s)
 - Host Institution(s)
 - E-mail address(es)
 - Mailing address
 - Date of Proposal
- Science Proposal
 - Abstract
 - Method of approach
 - Statement of importance/relevance to THORPEX
 - Commitment of the science supervisor/adviser
- Host Institution Information
 - Name of host institution and sponsoring department
 - Address
 - Supervisor/adviser's name and title, and contact information
 - Name, title and signature of individual authorized to commit the institution
 - Criteria and process to be used in selection of the postdoctoral appointee
(only required in those cases where a candidate has not been identified)
- Host institution resources
 - Observing facilities
 - Computing resources
 - Laboratory facilities
 - Resource scientists
- Post Doctoral Candidate Vita
 - Name,
 - Current address
 - Current affiliation
 - Title/abstract of dissertation
 - Thesis supervisor
 - Publications list
 - Honors/Awards
- Proposed Budget (by year and total)
 - Applicant's total requested level of salary support (person-months and funds)
 - Indirect costs (benefits and indirect costs)
 - Travel
 - Materials and supplies (must be directly relevant to the proposed research)
 - Total Annual Budget(s)
 - Requested Amount of Vaisala Support
 - Authorized Collateral Support Provided By Host Institution

7. About Vaisala

Vaisala is a global environmental measurements company founded in 1936 by Professor Vilho Vaisala, one of the early developers of the radiosonde. Headquartered in Helsinki, Finland, Vaisala has offices and facilities in 15 countries. Vaisala's meteorological and environmental instruments and measurement systems include: radiosondes, dropsondes, rocket sondes, and tethered meteorological towers; surface weather stations, *in situ* temperature, pressure, humidity and wind sensors; present weather sensors, transmissometers, and ceilometers; and total and cloud-to-ground lightning sensors, and radar wind profilers. Applications systems produced and supported include airport weather systems, road and rail weather detection and nowcasting systems, hydrological systems, and lightning detection systems. Vaisala also offers a wide range of industrial gas and pressure sensors. More information about the company and its products and services is available at www.vaisala.com.

8. About THORPEX (<http://www.mmm.ucar.edu/uswrp/thorpex>)

The skillful prediction of high-impact weather is one of the greatest scientific and societal challenges of the 21st century. Recent improvements in atmospheric observing technology, data assimilation methods, numerical model formulation, and the use of ensemble techniques have led to substantial increases in forecast skill. Despite these improvements, there continue to be limitations in our ability to forecast high-impact weather events. THORPEX is a ten-year international research program, under the auspices of the World Meteorological Organization/World Weather Research Program (WMO/WWRP), to accelerate improvements in short-range (up to 3 days), medium-range (3 to 7 days) and extended-range (week two) weather predictions and the societal value of advanced forecast products. THORPEX will examine predictability and observing-systems issues, and establish the potential to produce significant statistically-verifiable improvements in forecasts of high-impact weather. The program builds upon and coordinates advances being made in the operational forecasting and basic-research communities. The weather events to be considered include systems of mid-latitude, arctic, or tropical origin, are primarily synoptic-scale, and often contain significant embedded mesoscale features. THORPEX is fully global in scope.

The primary objective of THORPEX is to accelerate improvements in the prediction of high-impact weather on time scales out to two weeks. This will include international collaboration between the operational and research communities. In order to accomplish this objective, THORPEX will:

- Contribute to the development of a dynamically controlled and interactive operational forecast system in which the forecast model and data assimilation procedure are used to provide guidance on the optimal design and utilization of

the observing system. This will include the use of the new concept of targeting, whereby observations are utilized and/or supplemented where and when their impact on the quality of the analyses and forecasts is largest. THORPEX will provide guidance to agencies responsible for the design of the fixed and adaptive components of the regional and global observing system, including EUCOS, GCOS and NAOS.

- Advance basic knowledge of the predictability of high-impact weather. THORPEX research aims to address the degree to which predictive skill is limited by observations, data assimilation, forecast model error, or ensemble design at various forecast lead-times. An example is the determination of the dependence of predictive skill on inter-annual and intra-seasonal climate variability, e.g. ENSO, MJO and the Indian monsoon.
- Provide improved data sets for research activities relevant to CLIVAR, such as oceanic process studies, initialization of coupled ocean-atmosphere models, and OSEs designed to test the needs for longer timescale monitoring of the climate state over remote regions.
- Develop methods for assessing the economic and societal value of improved weather forecast skill. This will include the development and training in the use of appropriate end-user metrics. Assess the costs and user-benefits of improvements to the global observing network, and to data assimilation methods and forecast systems, as suggested by THORPEX research.